Cheatography

Vectors Cheat Sheet

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Axioms For Vector Spaces

To show that a given set with two operations is **NOT** a vector space, we need to show properly that at least one property of the ten above is violated.

(1) If **u**, **v**∈V, then **u**⊕**v**∈V [CLOSURE UNDER ADDITION]

(2) If **u**⊕**v**=**v**⊕**u** [COMMMUTATIVE LAW]

(3) If (**u**⊕**v**)⊕**w**=**u**⊕(**v**⊕**u**) ['⊕' IS ASSOCIATIVE]

(4) V contains the object "0" which satisfies **u**⊕0=0⊕**u**

For each **u**∈V, there exist an object **'-u'** such that **u**⊕**-u**=0 [ADDITIVE INVERSE]

(6) If **u**∈V*and **k**∈K, then k⊙**u**∈V [CLOSURE UNDER MULTIPLICATION]

(7) k⊙(**u**⊕**v**)=(k⊙**u**)⊕(k⊙**v**) [DISTRIBUTIVE LAW]

(8) (k+l)⊙**u**=(k⊙**u**)⊕(**l**⊙**u**)

(9) k⊙(l⊙**u**)=(kl⊙**u**)

(10) 1⊙**u**=**u**

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